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LAHIVE & COCKFIELD, LLP.  
28 STATE STREET  
BOSTON, MA 02109

EXAMINER

ABEL JALIL, NEVEEN

ART UNIT	PAPER NUMBER
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2175

DATE MAILED: 04/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/988,854

Applicant(s)

TELOH ET AL.

Examiner

Neveen Abel-Jalil

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 8-10, 12-17, 19-22 and 26-28 is/are rejected.
- 7) ☒ Claim(s) 5-7, 11, 18, 23-25, 29 and 30 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

### DETAILED ACTION

1. The amendment filed on January 22, 2004 has been received and entered. Claims 1-30 are pending.

#### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-4, 9-10, 13-14, 16-17, 19-22, and 27-28 are rejected under 35 U.S.C. 102(e) as being anticipated by Sicola et al. (U.S. Patent No. 6,658,590 B1).

As to claim 1, Sicola et al. discloses in a storage network, a method to update a first replica held by a physically remote storage device in said storage network (See abstract), said method comprising the steps of:

instructing a first data replication facility of a first electronic device in said storage network to log one or more writes to a local storage device when said first replica held by said physically remote storage device cannot be updated due to a detected error condition in the storage network (See column 13, lines 1-61);

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determining at said first electronic device if said detected error condition still exists in the storage network that prevents updating of said first replica held by said physically remote storage device (See column 14, lines 13-59);

instructing said first data replication facility of said first electronic device to replicate data corresponding to the one or more writes identified in said log to generate a second replica upon determination by said first electronic device that said first replica held by said physically remote storage device can be updated due to a removal of said detected error condition that prevents updating of said first replica held by said physically remote storage device (See column 14, lines 1-59, also see column 1, lines 7-12); and

outputting said second replica in accordance with a communication protocol from said first electronic device to a second data replication facility of a second electronic device of said physically remote storage device in said storage network to update said first replica (See column 6, lines 9-39).

As to claim 2, Sicola et al. discloses comprising the step of, identifying to said first data replication facility of said first electronic device which of said one or more writes to said local storage device should not be logged when said physically remote storage device cannot be updated (See column 12, lines 36-67).

As to claim 3, Sicola et al. discloses comprising the step of, instructing said first data replication facility of said first electronic device to automatically output said second replica to said second replication facility once generation of said second replica is complete (See column

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12, lines 20-35).

As to claim 4, Sicola et al. discloses comprising the step of, instructing said first replication facility of said first electronic device to prompt an operator of said first replication facility in order to obtain authorization for said output of said second data replica to said second data replication facility of said second electronic device to update said first replica (See column 2, lines 5-23, prior art).

As to claim 9, Sicola et al. discloses wherein said outputting from said first data replication facility of said first electronic device to said second data replication facility of said second electronic device occurs in a synchronous manner (See column 11, lines 5-47).

As to claim 10, Sicola et al. discloses wherein said communication protocol comprises the Transmission Control Protocol/Internet Protocol (TCP/IP) protocol suite (See column 4, lines 23-31).

As to claim 13, Sicola et al. discloses in a computer network having a plurality of programmable electronic devices, wherein each of said plurality of programmable electronic devices operates as a host device for a data replication facility for replicating data among said plurality of programmable electronic devices (See abstract), a method to handle a communication link failure in said computer network, said method comprising the steps of,

instructing each said data replication facility of each of said plurality of programmable electronic devices to enter a logging routine should said host device of said data replication facility detect said communication link failure (See column 13, lines 1-61),

wherein said logging routine halts said replicating of data by said replication facility of said host device and said replication facility of said host device identifies in a log each local write of said host device that detects said communication link failure (See column 5, lines 1-18); and

instructing each said data replication facility of each of said plurality of programmable electronic devices that initiated said logging routine to generate a replica for each said local write identified in said log upon reestablishment of said communication link (See column 14, lines 1-59, also see column 1, lines 7-12).

As to claim 14, Sicola et al. discloses comprising the steps of, grouping each said replica into a single data set; and forwarding said single data set in accordance with a communication protocol from a first of said plurality of programmable electronic devices to a second of said plurality of programmable electronic devices (See column 1, lines 7-11).

As to claim 16, Sicola et al. discloses wherein said first of said plurality of programmable electronic devices forwards said single data set in a synchronous manner (See column 11, lines 5-47).

As to claim 17, Sicola et al. discloses wherein said communication protocol comprises the Transmission Control Protocol/Internet Protocol (TCP/IP) protocol suite (See column 4, lines 23-31).

As to claim 19, Sicola et al. discloses a readable medium holding programmable electronic device readable instructions to perform a method in a storage network to update a first replica held by a physically remote storage device in said storage network (See abstract), said method comprising the steps of:

instructing a first data replication facility of a first programmable electronic device in said storage network to enter a first state to log, one or more writes to a local storage device when said first replica held by said physically remote storage device cannot be updated due to a detected error condition that does not allow transmission of data to said physically remote storage device (See column 13, lines 1-61);

determining at said first programmable electronic device if said first replica held by said physically remote storage device can be updated due an abatement of the detected error condition (See column 14, lines 13-59);

instructing said first data replication facility of said first programmable electronic device to replicate data corresponding to the one or more writes identified in said log in order to create a second replica upon determination by said first programmable electronic device that said first replica held by said physically remote storage device can be updated (See column 14, lines 1-59, also see column 1, lines 7-12);

outputting said second replica in accordance with a communication protocol from said first programmable electronic device to a second data replication facility of a second programmable electronic device in communication with said physically remote storage device in said storage network to update said first replica (See column 6, lines 9-39).

As to claim 20, Sicola et al. discloses comprising the step of, identifying to said first data replication facility of said first programmable electronic device which of said one or more writes to said local storage device should not be logged when said physically remote storage device cannot be updated (See column 12, lines 1-35).

As to claim 21, Sicola et al. discloses comprising the step of, instructing said first data replication facility of said first programmable electronic device to automatically transmit said second replica to said second replication facility once creation of said second replica is complete (See column 4, lines 24-52).

As to claim 22, Sicola et al. discloses comprising the step of, at said first replication facility of said first programmable electronic device, prompting an operator of said first replication facility to obtain permission for said outputting of said second data replica to said second data replication facility of said second programmable electronic device to update said first replica (See column 6, lines 51-67).



As to claim 27, Sicola et al. discloses wherein said outputting from said first data replication facility of said first programmable electronic device to said second data replication facility of said second programmable electronic device occurs in a synchronous manner (See column 11, lines 5-47).

As to claim 28, Sicola et al. discloses wherein said communication protocol comprises the Transmission Control Protocol/Internet Protocol (TCP/IP) protocol suite (See column 4, lines 23-31).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 8, 12, 15, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sicola et al. (U.S. Patent No. 6,658,590 B1) in view of Carter et al. (U.S. Patent No. 5,909,540).

As to claim 8, Sicola et al. does not teach comprising the step of, forwarding from said first data replication facility of said first electronic device to said second data replication facility at said second electronic device information identifying a storage location on said physically remote storage device for storage of said second replica.

Carter et al. teaches comprising the step of, forwarding from said first data replication

facility of said first electronic device to said second data replication facility at said second electronic device information identifying a storage location on said physically remote storage device for storage of said second replica (See column 16, lines 19-38).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Sicola et al. to include comprising the step of, forwarding from said first data replication facility of said first electronic device to said second data replication facility at said second electronic device information identifying a storage location on said physically remote storage device for storage of said second replica.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Sicola et al. by the teaching of Carter et al. to include comprising the step of, forwarding from said first data replication facility of said first electronic device to said second data replication facility at said second electronic device information identifying a storage location on said physically remote storage device for storage of said second replica.

As to claim 12, Sicola et al. does not teach wherein said log comprises a bitmap holding one or more bits, wherein each of the one or more bits in the bit map indicates a storage location written to on the local storage device.

Carter et al. teaches wherein said log comprises a bitmap holding one or more bits, wherein each of the one or more bits in the bit map indicates a storage location written to on the local storage device (See column 31, lines 10-29).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Sicola et al. to include wherein said log comprises a

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bitmap holding one or more bits, wherein each of the one or more bits in the bit map indicates a storage location written to on the local storage device.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Sicola et al. by the teaching of Carter et al. to include wherein said log comprises a bitmap holding one or more bits, wherein each of the one or more bits in the bit map indicates a storage location written to on the local storage device because bitmap is a well known and efficient method in the database art log and present resource mapping for storage and update purposes.

As to claim 15, Sicola et al. does not teach comprising the step of, packaging with said single data set information identifying a storage location for storage of said single data set on a storage device of said second of said plurality of programmable electronic devices.

Carter et al. teaches comprising the step of, packaging with said single data set information identifying a storage location for storage of said single data set on a storage device of said second of said plurality of programmable electronic devices (See column 16, lines 19-38).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Sicola et al. to include comprising the step of, packaging with said single data set information identifying a storage location for storage of said single data set on a storage device of said second of said plurality of programmable electronic devices.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Sicola et al. by the teaching of Carter et al. to include comprising the step of, packaging with said single data set information identifying a storage location for storage

of said single data set on a storage device of said second of said plurality of programmable electronic devices because identifying the physical storage location on the of the replica provides for efficient network database management.

As to claim 26, Sicola et al. does not teach comprising the step of, forwarding from said first data replication facility of said first programmable electronic device to said second data replication facility at said second programmable electronic device information identifying a storage location on said physically remote storage device for storage of said second replica.

Carter et al. teaches comprising the step of, forwarding from said first data replication facility of said first programmable electronic device to said second data replication facility at said second programmable electronic device information identifying a storage location on said physically remote storage device for storage of said second replica (See column 16, lines 19-38).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Sicola et al. to include comprising the step of, forwarding from said first data replication facility of said first programmable electronic device to said second data replication facility at said second programmable electronic device information identifying a storage location on said physically remote storage device for storage of said second replica.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Sicola et al. by the teaching of Carter et al. to include comprising the step of, forwarding from said first data replication facility of said first programmable electronic device to said second data replication facility at said second programmable electronic device

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information identifying a storage location on said physically remote storage device for storage of said second replica because identifying the physical storage location on the of the replica provides for efficient network database management.

*Allowable Subject Matter*

6. Claims 5-7, 11, 18, 23-25 and 29-30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record (Dziadosz et al. -U.S. Patent No. 5,832,222, and Carter et al. -U.S. Patent No. 5,909,540, and Sicola et al. -U.S. Patent No. 6,658,590 B1) do not disclose, teach, or suggest the claimed limitations of (in combination with all other features in the claim), comprising the step of, instructing said second replication facility of said second electronic device to log said one or more writes to a second local storage device of said second electronic device, as claimed in claim 6.

Claim 7 is objected to as allowed over the prior art made of record, because it is dependent from the objected to claim 6.

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The prior art of record (Dziadosz et al. -U.S. Patent No. 5,832,222, and Carter et al. -U.S. Patent No. 5,909,540, and Sicola et al. -U.S. Patent No. 6,658,590 B1) do not disclose, teach, or suggest the claimed limitations of (in combination with all other features in the claim), wherein each of said plurality of programmable electronic devices in said computer network operate without a volume manager facility, as claimed in claims 11, 18, and 29.

The prior art of record (Dziadosz et al. -U.S. Patent No. 5,832,222, and Carter et al. -U.S. Patent No. 5,909,540, Sicola et al. -U.S. Patent No. 6,658,590 B1) do not disclose, teach, or suggest the claimed limitations of (in combination with all other features in the claim), comprising the steps of, instructing said first replication facility of said first programmable electronic device to exit said first state upon said determination that said first replica can be updated; and instructing said first replication facility of said first programmable electronic device to enter a second state to initiate creation of said second replica upon said determination that said first replica can be updated, as claimed in dependent claims 5, and 23.

The prior art of record (Dziadosz et al. -U.S. Patent No. 5,832,222, and Carter et al. -U.S. Patent No. 5,909,540, and Sicola et al. -U.S. Patent No. 6,658,590 B1) do not disclose, teach, or suggest the claimed limitations of (in combination with all other features in the claim), comprising the steps of, detecting a communication link failure in said storage network between said first programmable electronic device and said second programmable electronic device; and instructing said second replication facility of said second programmable electronic device to

enter said first state to log one or more writes to a second local storage device coupled to said second programmable electronic device, as claimed in dependent claim 24.

The prior art of record (Dziadosz et al. -U.S. Patent No. 5,832,222, and Carter et al. -U.S. Patent No. 5,909,540, and Sicola et al. -U.S. Patent No. 6,658,590 B1) do not disclose, teach, or suggest the claimed limitations of (in combination with all other features in the claim), detecting an available communication link in said storage network between said first electronic device and said second electronic device to transport data between said first electronic device and said second electronic device; prompting said system operator to select a primary replication facility and a secondary replication facility from amongst said first replication facility of said first electronic device and said second replication facility of said second electronic device; upon selection by said system operator, instructing said primary replication facility to generate said second replica of data identified in said log; and instructing said primary replication facility to output said second replica for transmission to said secondary replication facility via said available communication link to update said first replica, as claimed in claims 7 and 25.

The prior art of record (Dziadosz et al. -U.S. Patent No. 5,832,222, and Carter et al. -U.S. Patent No. 5,909,540, and Sicola et al. -U.S. Patent No. 6,658,590 B1) do not disclose, teach, or suggest the claimed limitations of (in combination with all other features in the claim), wherein said log comprises a bitmap to hold one or more pointers, wherein each of the one or more pointers indicate a location on a storage device written to during said first state, as claimed in claim 30.

***Response to Arguments***

8. Applicant's arguments with respect to claims 1-37 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Neveen Abel-Jalil whose telephone number is 703-305-8114.

The examiner can normally be reached on 8:00AM-4: 30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dov Popovici can be reached on 703-305-3830. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Neveen Abel-Jalil  
April 4, 2004

*Charles Rones*  
CHARLES RONES  
EXAMINER